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Optical study of phonons and electronic excitations in tetragonal Sr 2VO4

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Abstract

We report on the optical excitation spectra in Sr2VO 4. The phonon modes are assigned and their evolution with temperature is discussed in the frame of the different phase transitions crossed upon cooling. Besides the expected infrared-active phonons, we observe two additional excitations at about 290 and 840 cm-1, which could correspond to electronic transitions of the V4+ ions. Our experimental results are discussed in the context of recent experimental and theoretical studies of this material with a unique spin-orbital ground state. © 2011 American Physical Society.

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